4-9-2011

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The blood-brain barrier (BBB) is both a metabolic and physical membrane that separates the central nervous system (CNS) from systemic circulation. Tight junction (TJ) proteins of vascular endothelial cells work in conjunction with astrocytes and pericytes to maintain the integrity of the BBB. Recent studies have shown that the degradation of the BBB after acute ischemic stroke is related to the inflammation and necrosis of brain tissue. For this reason, a further understanding of the degradation mechanisms that contribute to the breakdown of the BBB could assist in the clinical treatment of ischemic stroke. In this study, I correlate the distribution of one TJ protein, claudin-5, with the breakdown of the BBB. The results of which report an increase in claudin-5 expression in ischemic tissue following the degradation of the BBB, which may prove claudin-5 to be a useful marker of the integrity of the BBB following acute ischemic stroke.